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Customer No.: 31561
Docket No.: 9173-US-PA
Application No.: 10/604,270

AMENDMENTS

To the Claims:

Claim 1 (currently amended) A method to design a liquid crystal display (LCD) device, implemented in a computing system, the method comprising the steps of:

measuring at least one viewing angle in each of a plurality of liquid crystal display films, and determining a desired range of a cell gap between liquid crystal adjacent cells of a liquid crystal display device according to a statistic relation between the cell gap and the viewing angle;

calculating a panel transmittance rate and a gamut of a plurality of liquid crystal modules, and determining at least one value from the range of the cell gap;

obtaining optic characteristics of a plurality of color filter films and color modules, and determining a set of optic characteristics for a color filter as well as for the liquid crystal display device;

measuring ~~a set of measured values with respect to~~ the set of optic characteristics for a LCD modeling module, to obtain a set of measured values indicating the set of optic characteristics;

computing out a set of modeling values indicating ~~with respect to~~ the set of optic characteristics for the LCD modeling module, according to a model of the LCD modeling module; and

adjusting a plurality of given quantities indicating ~~representing~~ the set of optic characteristics of the liquid crystal display device and the color filter to be designed,

according to a difference between the set of measured values and the set of modeling values, thereby producing a plurality of actually designed quantities indicating ~~representing~~ an adjusted set of optic characteristics of the liquid crystal display device and the color filter.

Claim 2 (currently amended) The method of claim 1, wherein the range of the cell gap is determined by using at least two values from the range of the cell gaps of the plurality of liquid crystal display films along with the viewing angles corresponding thereto, thereby establishing the statistic relation ~~a formula~~ expressing the range using the values of the cell gaps and the corresponding viewing angles.

Claim 3 (currently amended) The method of claim 2, wherein the formula is obtained using a statistic analysis of trendline regression.

Claim 4 (previously presented) The method of claim 1, wherein the at least one value from the range of the cell gap between liquid crystal cells of the liquid crystal display device is determined using the panel transmittance rate and gamut of a plurality of liquid crystal modules for establishing a plurality of relationships between the panel transmittance rate and the gamut therewith.

Claim 5 (previously presented) The method of claim 4, wherein the panel transmittance rate is defined as follows:

panel transmittance rate = Y * aperture ratio correction * gap of liquid crystal cell correction *

measured value correction,

where Y denotes optic characteristic co-ordinate values; aperture ratio correction is defined as the ratio of product or device aperture rate with the standard module opening rate; and the gap of liquid crystal cell correction is a ratio of a liquid crystal transmittance of a target cell gap to a liquid crystal transmittance of a reference cell gap, based on a statistic relation between parameters of liquid crystal transmittance and cell gap.

Claim 6 (previously presented) The method of claim 4, wherein the relationship between the panel transmittance rate and the gamut is determined by trendline regression.

Claim 7 (original) The method of claim 1, wherein the optic characteristics of the module are determined by color filter film thickness.

Claim 8 (original) The method of claim 7, wherein the optic characteristics of the module are derived using trendline regression.

Claim 9 (original) The method of claim 1, wherein the optic characteristics include a set of products, wherein each product has factor one which is the ratio of measured value with modeled value and factor two which is a correction of the optic characteristics.

Claim 10 (original) The method of claim 1, wherein the color module includes

liquid crystal film and color filter film.

Claim 11 (currently amended) A method to design a liquid crystal display (LCD) module suitable for being implemented in a system for designing a product, the system includes a database, wherein the database stores information of color characteristic parameters relating to a plurality of liquid crystal films, to a plurality of color filter films, to a plurality of testing modules, and to a plurality of standard module, the method comprising the steps of:

measuring data relating to a plurality of liquid crystal cell gaps and respective viewing angle, providing an expression of the relationships between the viewing angles and cell gaps, and deriving a desired range of the cell gaps;

calculating a data relating to a plurality of panel transmittance rate and respective color gamut, providing an expression of the relationships between the plurality of panel transmittance rate and respective color gamut, and deriving at least one cell gap value;

obtaining data relating to the plurality of color filter films and testing modules, and providing a set of expressions of relationships including the relationship of color filter film thickness with color filter characteristics, the relationship of color filter characteristics with liquid crystal testing module, and determining a color filter standard and a product standard for a product module based upon the above relationship;

measuring ~~a set of measured value with respect to~~ the standards for a LCD modeling module, to obtain a set of measured values indicating the set of optic characteristics;

computing out a set of modeling values indicating ~~with respect to~~ the standards for the LCD modeling module, according to a model of the LCD modeling module; and

correcting the standards for the product module according to a difference between the set of measured value and the set of modeling value.

Claim 12 (original) The method of claim 11, wherein the testing module includes at least one liquid crystal film and a set of color filter films.

Claim 13 (original) The method of claim 11, wherein the expression of the relationships between the viewing angles and cell gaps are expressed using trend line regression.

Claim 14 (previously presented) The method of claim 11, wherein the panel transmittance rate is defined as follows:

panel transmittance rate = Y * aperture ratio correction * gap of liquid crystal cell correction * measured value correction,

where Y denotes optic characteristic co-ordinate values; aperture ratio correction is defined as the ratio of product or device aperture rate with the standard module opening rate; and the gap of liquid crystal cell correction is a ratio of a liquid crystal transmittance of a target cell gap to a liquid crystal transmittance of a reference cell gap, based on a statistic relation between parameters of liquid crystal transmittance and cell gap.

Claim 15 (previously presented) The method of claim 11, wherein the relationship between the panel transmittance rate and the gamut is determined by trendline

regression.

Claim 16 (original) The method of claim 11, wherein the expressions of relationship is derived using trendline regression.

Claim 17 (currently amended) A liquid crystal device (LCD) designing system to design a liquid crystal module for designing a prototype of a product, the system includes a measuring system for measuring parameters from a plurality of liquid crystal films, a plurality of color filter films, a plurality of testing modules, and a plurality of standard modules, and a computing system for performing a method comprising the following steps:

according to at least one viewing angle among a plurality of liquid crystal display films, and determining a desired range of a cell gap between liquid crystal cells of a liquid crystal display device;

calculating the panel transmittance rate and gamut of a plurality of liquid crystal modules, and determining at least one value from the range of the cell gap between liquid crystal cells of the liquid crystal display device;

obtaining optic characteristics of a plurality of color filter films and color modules, and determining a set of optic characteristics for a color filter as well as for the liquid crystal display device;

measuring ~~a set of measured values with respect to~~ the set of optic characteristics for a LCD modeling module, to obtain a set of measured values indicating the set of optic characteristics;

computing out a set of modeling values indicating ~~with respect to~~ the set of optic characteristics for the LCD modeling module, according to a model of the LCD modeling module; and

adjusting a plurality of to-be-designed quantities indicating ~~representing~~ the set of optic characteristics of the liquid crystal display device and the color filter to be designed according to a difference between the set of measured values and the set of modeling values, thereby producing a plurality of actually designed quantities indicating ~~representing~~ an adjusted set of optic characteristics of the liquid crystal display device and the color filter.

Claim 18 (currently amended) The LCD designing system of claim 17, wherein the steps of the method are implemented using a computer program.

Claim 19 (currently amended) A liquid crystal device (LCD) designing system to design a liquid crystal module for designing a prototype of a product, wherein color characteristic parameters relating to a plurality of liquid crystal film, to a plurality of color filter film, to a plurality of testing modules, and to a plurality of standard module are stored therein, the system has an operation process, the operation process comprising the steps of:

measuring data relating to a plurality of liquid crystal cell gaps and respective viewing angle, providing an expression of the relationships between the viewing angles and the cell gaps, and deriving a desired range of the cell gaps;

calculating data relating to a plurality of panel transmittance rates and respective color gamuts, providing an expression of the relationships between the plurality of panel

transmittance rates and respective color gamut, and deriving at least one cell gap value;

obtaining data relating to the plurality of color filter films and testing modules, providing a set of expressions of relationships including the relationship of color filter film thickness with color filter characteristics, the relationship of color filter characteristics with liquid crystal testing module, and determining a color filter standard and a product standard for a product module based upon the above relationship;

measuring ~~a set of measured value with respect to~~ the standards for a LCD modeling module, to obtain a set of measured values indicating the set of optic characteristics;

computing out a set of modeling value indicating ~~with respect to~~ the standards for the LCD modeling module, according to a model of the LCD modeling module; and

correcting the standards for the product module according to a difference between the set of measured value and the set of modeling value.

Claim 20 (currently amended) The LCD designing system of claim 19, wherein ~~a computer program is used to perform~~ the steps is performed by executing a computing program written accordingly.